Nitrogen Efficiency in Drip Irrigated Almonds

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Objective

Determine the fate of fertilizer N applied to a drip-irrigated almond orchard under acidified soil conditions.

Summary

Three replications of drip irrigated Nonpareil almonds on Lovell peach root were pretreated with ammonium sulfate or calcium nitrate to produce differences in soil acidity in the wetted soil. Data showed that extractable N decreases as distance from the tree and N source increases. The ratio of ammonium to nitrate also decreases with distance and is strongly correlated with soil pH. In all cases, the soil pH was greater in the calcium nitrate treatments compared to the ammonium sulfate treatments. Results also showed that ammonium sulfate is strongly acidifying when concentrated in small area utilized by drip system. Fine root biomass was greater in the ammonium treatment in spite of lower pH levels. A greater N supply is the most probable reason, but other interactions with pH can not be ruled out. Between monthly fertilizations, pH may vary as much as 3 units and levels of soluble N fluctuate several hundred mg/L. The strong acidification associated with ammonium sulfate may have significant long-term consequences and needs to be monitored.